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| Michael J. Urbano, Esq. 1445 Princeton Drive Bethlehem, PA 18017-9166 | | | EXAMINER CHEN, SHIH CHAO | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

09/915,963

Applicant(s)

PETERSON, GEORGE EARL

Examiner

Shih-Chao Chen

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-10, 13-20 and 22-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-10, 13-20 and 22-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3-7, 9-10, 13-16, 19, 22-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (U.S. Patent No. 6,317,094) in view of Ogot et al. (U.S. Patent No. 5,648,787).

Regarding claim 3, Wu et al. teaches in figures 5-40 an antenna structure comprising: at least one antenna element [224, 226] having at least one taper (See FIGURE 21); and a ground plane [204] coupled with the at least one antenna element.; wherein the ground plane is separated from the at least one antenna element (i.e. separate by air gap [208]) but is in sufficiently close proximity thereto to cause fast wave excitation thereof; wherein the at least one antenna element comprises a traveling wave antenna (See col. 7, lines 1-14) supporting a phase velocity greater than the speed of light (Examiner note: the word "supporting" is to perform a giving function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense) and wherein the taper comprises a linear profile (See FIGURE 21 & 23).

Regarding claim 4, Wu et al. teaches in figures 5-40 an antenna structure comprising: at least one antenna element [314,316], the at least on antenna element

having at least one taper (See FIGURE 23); and a ground plane [304] coupled with the at least one antenna element.; wherein the at least one antenna element comprises a traveling wave antenna (See col. 7, lines 1-14) supporting a phase velocity greater than the speed of light (Examiner note: the word "supporting" is to perform a giving function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense) and wherein the antenna structure [300] supports a cigar-like directional three-dimensional beam pattern and a butterfly wing-like directional three- dimensional beam pattern (Examiner note: the word "supports or like" is to perform a giving function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense).

Regarding claim 5, Wu et al. teaches in figures 5-40 the antenna structure of Claims 3 or 4, wherein the at least one antenna element [314,316] is positioned at an angle from the ground plane [304] (See FIGURE 23).

Regarding claim 6, Wu et al. teaches in figures 5-40 the antenna structure of Claim 5, wherein the angle is about 90 degrees with respect to the x-, y- and z- axes (See FIGURE 23).

Regarding claim 7, Wu et al. teaches in figures 5-40 the antenna structure of Claim 1, wherein the at least one antenna element [314,316] is coupled with the ground plane [304] by means of an unbalanced impedance [308].

Regarding claim 9, Wu et al. teaches in figures 5-40 the antenna structure of Claim 7, wherein a first conductor of the unbalanced impedance [308] mechanically couples the at least one antenna element [314,316] with the ground plane [304].

Regarding claim 13, Wu et al. teaches in figures 5-40 an antenna structure comprising: an array of at least two antenna elements [224, 226], each antenna element having at least one taper (See FIGURE 23); a ground plane [204]; wherein the ground plane is separated from the at least one antenna element (i.e. separate by air gap [208]) but is in sufficiently close proximity thereto to cause fast wave excitation thereof; and an unbalanced impedance [308] for coupling the array of at least two antenna elements with the symmetrical ground plane; wherein at least one antenna element of the array comprises a traveling wave antenna (See col. 7, lines 1-14) supporting a phase velocity greater than the speed of light (Examiner note: the word "supporting" is to perform a giving function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense) and wherein the taper of at least one antenna element of the array comprises a linear profile (See FIGURE 23 \$ 27B).

Regarding claim 14, Wu et al. teaches in figures 5-40 an antenna structure comprising: an array of at least two antenna elements [224, 226], each antenna element having at least one taper (See FIGURE 21); a ground plane [204]; wherein the ground plane is separated from the at least one antenna element (i.e. separate by air gap [208]) but is in sufficiently close proximity thereto to cause fast wave excitation thereof and an unbalanced impedance [308] for coupling the array of at least two antenna elements with the symmetrical ground plane; wherein at least one antenna element of the array comprises a traveling wave antenna (See col. 7, lines 1-14) supporting a phase velocity greater than the speed of light (Examiner note: the word "supporting" is to perform a

giving function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense) and wherein each antenna element of the array supports a cigar-like directional three-dimensional beam pattern and a butterfly wing-like directional three-dimensional beam pattern (Examiner note: the word "supports" is to perform a giving function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense).

Regarding claim 15, Wu et al. teaches in figures 5-40 the antenna structure of Claims 13 or 14, wherein each antenna element of the array [224, 226] is positioned at an angle from the ground plane [204].

Regarding claim 16, Wu et al. teaches in figures 5-40 the antenna structure of Claim 15, wherein the angle for each antenna element [314, 316] is about 90 degrees with respect to the x-, y- and z- axes.

Regarding claims 22-23 and 25 are claiming the common subject matter as above.

Wu et al. teaches every feature of the claimed invention except for a symmetrical finite ground plane; and the symmetrical ground plane is disk shape.

Ogot et al. teaches in figure 3A a symmetrical finite ground plane [210 or 250]; and the symmetrical ground plane is disk shape.

In view of the above statement, it would have been obvious to one having ordinary skill in the art at the time the invention was made by using the ground plane as taught by Ogot et al. in order to maximize the surface area of the ground plane perpendicular

to the transmission element, and provides a uniform transmission pattern (See col. 4, lines 66-67 & col. 5, lines 1-3).

3. Claims 8, 17-18 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. in view of Ogot et al. as applied to claims 3-7, 9-10, 13-16, 19, 22-23 and 25 above, and further in view of Applicant cited prior art (FIG. 1).

Wu et al and Ogot et al. teach every feature of the claimed invention except for the unbalanced impedance comprises a coaxial cable.

Applicant cited prior art (FIG. 1) teaches the unbalanced impedance comprises a coaxial cable [35].

In view of the above statement, it would have been obvious to one having ordinary skill in the art at the time the invention was made by using unbalanced impedance commonly comprises a coaxial cable as taught by Applicant cited prior art in order to have the different type of the feed line.

4. Claims 20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (Cited above) in view of Kraus (J.D. Kraus, "Antenna", 2nd ED., McGraw Hill, Inc., New York (1988), pp759-760).

Wu et al. teaches every feature of the claimed invention except for a slow wave antenna to widen the directivity of the antenna structure.

Kraus teaches in figures 16-41 & 16-42 the at least one antenna element (Leaky-wave antennas) comprises a traveling wave antenna supporting a phase velocity greater than the speed of light; and a slow wave antenna (Surface-wave antenna) to widen the directivity of the antenna structure,

In view of the above statement, it would have been obvious to one having ordinary skill in the art at the time the invention was made by using leaky-wave antenna or surface-wave antenna as taught by Kraus in order to have the structure carries a fast wave ($v > c$) or a slow wave ($v < c$).

5. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (Cited above) in view of Wicks et al. (US H2016 H).

Wu et al. teaches every feature of the claimed invention except for the distance between the lower edge of the at least one antenna element or each of the at least two antenna elements and the ground plane is tapered.

Wicks et al. teaches in figures 2a, 2b and 5 the distance between the lower edge of the at least one antenna element or each of the at least two antenna elements [mono-blade antenna element] and the ground plane [ground plane] is tapered.

In view of the above statement, it would have been obvious to one having ordinary skill in the art at the time the invention was made by using the mono-blade antenna element & the ground plane as taught by Wicks et al. in order to have a low voltage standing wave ratio (See Abstract).

Response to Arguments

6. Applicant's arguments with respect to claims 3-10, 13-20, and 22-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-Chao Chen whose telephone number is (571) 272-1819. The examiner can normally be reached on Monday-Thursday from 7 AM to 5:30 PM, Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacob Y. Choi can be reached on (571) 272-2367. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shih-Chao Chen
Primary Examiner
Art Unit 2821

SXC
January 9, 2011
/Shih-Chao Chen/
Primary Examiner, Art Unit 2821